Installation and User Manual

Mini DURAN 203

CO Detection

DURAN®
electrónica

INDEX

DESCRIPTION OF THE SYSTEM

Mini DURAN 203 is a Carbon Monoxide detection system using semiconductor technology that controls up to 4 detectors.

It uses **DURAN 203 PLUS** detectors with technology by semiconductor and 8 bits microprocessor that guarantees exact resolution, and a perfect functioning that has attracted acclaim and prestige throughout Europe.

Mini DURAN 203 is the idoneous system for gas detection in parkings, mechanical workshops and small areas in general.

1. CONNECTION/DISCONNECTION

DURAN 203 PLUS detectors

Once the control panel and detectors are installed, connect them to power grid, and "OFF" will show up in the display.

1. Press ON/OFF to switch on the control panel.

"ON" will show up in the screen, followed by "GR1"

Err If there was to be any failure, detectors were not properly connected, cabling error or if the line protection fuse was blown, this message will appear on screen and an acoustic alarm will go off. Following this the control panel will switch itself off.

2. Press ON/OFF if you wish to switch off the control panel.

How the DURAN 203 PLUS detector operates

The detector will carry out a measurement every 150 s, of this time:
- 90 s correspond to the `Decontamination Phase´. During this cycle the inside reaches a temperature of approx. 450º C. As a result of this high temperature, the residues of gas deposited on the electrode are eliminated and the humidity accumulated on the inside is evaporated. During this time interval CO is not measured.

- Then, another 60 s cycle is started, called the `cooling cycle´, in which the detector begins to cool off until it reaches a temperature of 225º C approx. (the optimum temperature to detect CO). During this time interval the CO is not measured.

Immediately after completing this cycle the detector carries the CO reading in a few miliseconds and sends it to the module line, starting again from decontamination phase.

Testing the detector with gas

To carry out this test, wait until the detector is about to carry out a measurement (LED is blinking quickly).

At this point, and for a few seconds, apply CO to the detector at about 5 cms from the entry grill. After approximately 18 s, the module line will show the concentration detected.

Remember that diesel vehicles do not generate CO.

2. PUSH KEYPAD



ON/OFF
Connect and disconnect the Control Unit.



SILENCE ACOUSTIC/PROGRAMMING
SILENCE ACOUSTIC
When acoustics are ON it disconnects the internal acoustic signals of the different events.

PROGRAMMING
If pressed for more than 3 s it allows to enter in the programming, events memory visualization, line test and detectors calibration menus.



VENTILATION
The sequence order of this push button is cyclic:
"AUTOMATIC->MANUAL->STOP->AUTOMATIC...".

AUTOMATIC: When a detector reaches a CO concentration equal or greater that the one programmed to activate the ventilation, then the maneuver will be retarded until the next reading. If the level remains, the ventilation will automatically START after 2 cycles (300 s).

MANUAL: This activates the ventilation independently of the existing CO level. the VENTILATION LEVEL LED will remain permanently lit up.

STOP: this prevents or stops the ventilation if it is activated. The VENTILATION ON LED will light off.



TEST/FORWARD
TEST

If you want to carry out a test, keep TEST/FORWARD pressed for more than 3 s and the Control Unit will enter in this mode connecting:
- All the segments of the 888 displays.
- VENTILATION LEVEL LED.
- VENTILATION ON LED and an internal acoustic.
- Alarm relay (for 4 s).
- The Ventilation. The display will shows UEn and the VENTILATION ON LED will light UP for 10 s, returning to its initial position afterwards.

FORWARD
It allows to advance in the PROGRAMMING menu.

3. LEDS

- **POWER**
  This indicates presence of 230V AC

- **VENTILATION LEVEL**
  Permanently lit: This indicates that one or more detectors have reached the programmed ventilation level.

- **VENTILATION ON**
  a) Blinking light: This indicates that one or more detectors have reached the programmed ventilation level.
  b) Permanently lit: This indicates that ventilation is activated.
  c) Light off: This indicates that ventilation is deactivated.

4. ACOUSTICS

- **Slow blinking:** This indicates that the programmed Ventilation level has been reached.
- **Fast blinking:** This indicates that the programmed Alarm level has been reached.
- **Very Slow blinking:** This indicates sensor fault. The messages:

CO level and SEn will alternate on the display.

• **Very Fast blinking:** This indicates line error. The display will show EL I

• **Permanently lit up:** This indicates saturation (the equipment range -300ppm.- Has been exceeded). The display will show SAt

• **Deactivate momentarily:** When the acoustics are deactivated, press SILENCE ACOUSTIC/ PROGRAMMING

It will rearm automatically.

• **Deactivate acoustic for Ventilation/Alarm and Saturation level permanently:** Press 3 times, display will show dES (the acoustic of error and fault damage will remain operative).

• **Acoustics activation:** Press SILENCE ACOUSTICS/PROGRAMMING again 3 times in a row and the display will show ACt

5. DISPLAY MESSAGES

"ELI". Line Error
This indicates that there is no communication between the Control Unit and the first detector due to a cut in the line or a short circuit (see detector LED codes in the 7.1 section).

"SEn". Sensor Error
This indicates that a detector has its sensor filament fused and an electronic fault exists (see detector LED codes in the 7.1 section).

"SAt". Saturation
This indicates that the Control Unit range (300 ppm) has been exceeded.

"CAL". Calibration
This indicates that the detectors are in CALIBRATION mode.

"tLI". Line test.
This indicates that the Control Unit is testing the detector line.

"ALA". Alarm Level
This indicates that the programmed Alarm Level has been reached, it alternates with the CO measure.

6. PROGRAMMING

The sequence of the programming menus and events memory is as follows:

1º.- Ventilation Level
2º.- Alarm Level
3º.- Alarms Memory / 4º.- Ventilation Memory / 5º.- Disconnection Memory
6º.- Detector Calibration
7º.- Line Test

The programming sequences described next start from a normal functioning status (CO concentration reading), not from a previous one.

If your enter into programming mode and do not press any key in 15s, the menu will automatically START moving through the different options until it leaves this mode and returns to CO reading mode.

6.1 VENTILATION LEVEL

At factory, it is programmed at 50ppm. To programme the ventilation at other levels, follow the next steps:

> Keep **PROGRAMMING** pressed for 3 s. The **VENTILATION LEVEL LED** will light UP and the display will show the last programmed level.

> Press **PROGRAMMING** to change the level. The display will show 020

> Press **FORWARD** until the required level is shown. The level sequence is:
20 - 30 - 40 - 50 - 60 - 70 - 80 - 90 - 100 - 150 - 200 - 250 - 20...

>Press **PROGRAMMING** again to memorise the new ventilation level.

6.2 ALARM LEVEL (Evacuation)

At factory, is programmed at 100ppm. To programme the ventilation at other levels, follow the next steps:

> Keep **PROGRAMMING** pressed for 3 s. The VENTILATION LEVEL LED will light UP and the display will show the last programmed level.

> Press **FORWARD** and the display will show the last programmed alarm level.

> Press **PROGRAMMING** to change the level. The display will show 020

> Press **FORWARD** until the new ventilation level shows up. The level sequence is:
20 - 30 - 40 - 50 - 60 - 70 - 80 - 90 - 100 - 150 - 200 - 250 - 20...

> Press **PROGRAMMING** again to memorise the new alarm level.

6.3 ALARMS MEMORY / 6.4 VENTILATION MEMORY / 6.5 DISCONNECTION MEMORY

The system can memorise up to 300 events (100 of each type: Alarm, Ventilation and Disconnection). Following the order appearance on the display:

- **Alarm:** A-number-number.
- **Ventilation:** U-number-number.
- **System Disconnection:** d-number-number.

VISUALISING A MEMORISED EVENT / COUNTER

> Keep **PROGRAMMING** pressed for 3 S.

> Press **FORWARD** until the initial of the event A, U or d, followed by numbers shows up.

RESETING A COUNTER

This option is indicated to check on the lack or excess of ventilations and/or alarms in short periods of time, as well as systems disconnections.

> Keep **PROGRAMMING** pressed for 3 s.

> Press **FORWARD** until the initial of the event (A, U or d) is visualised.

> Press **PROGRAMMING** to reset the memorised events.

WARNING

When the event memory counter exceeds 100 events, the display will show the initial letter (A, U, or d) followed by --- indicating memory overload.

6.6 DETECTOR CALIBRATION

This calibration should be carried out at a laboratory and by skilled and authorized personnel.

6.7 LINE TEST

Once the system has been installed, we recommended to test the line to check the correct functioning of all detectors connected to the lines.

- **PROCEDURE:**

>Keep **PROGRAMMING** pressed for 3 s.

>Press **FORWARD** until the display shows tL1

>Press **PROGRAMMING**, then the message tL1 will blink.

>Observe the detectors **LED**:

Blinking LED: Operation is correct.

LED lit off: This indicates a detector failure or lack of communication with the Control Unit due to CUT off cable or to incorrect assembling of the detector to its base.

Press **FORWARD** to leave the **LINE TEST** mode.

7. LED CODES

These are the LED codes for **DURAN 203 PLUS** detector:

• **Green LED flashing every 10 s:** Normal functioning.

• **Red LED flashing for 15 s:** It indicates the detector is about to measure.

• **Red LED permanently lit up:** It indicates the concentration of CO is 50ppm or higher.

• **Red and green LEDs lit up simultaneously:** Out of operation. The detector has not communicate with the Control Unit for more than 4 minutes. Check the cabling and make sure the detector is properly connected to its base.

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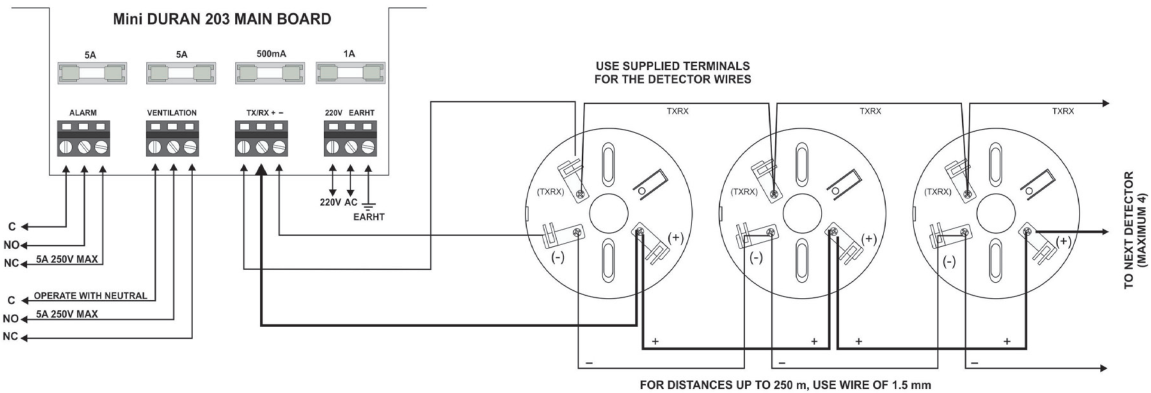
8. TECHNICAL CHARACTERISTICS OF THE CONTROL UNIT

TECHNOLOGY	Microprocessor
SAMPLING CAPACITY	4 detectors
READING MODE	Maximum CO reading. One reading every 150 s
COMMUNICATION	2 x 1.5 mm^2 supply wires and 1 TX / RX line
VENTILATION AND ALARM LEVELS	12 programmable levels in steps of 10ppm (from 20 to 100) and steps of 50 (from 100 to 250)
MAX. LENGTH BETWEEN CONTROL UNIT AND DETECTOR	Between 250-300 m of 1.5 mm^2 wire
VENTILATION AND ALARM OUTPUT	By 1 relay circuit, 5A dry contact fuse protected
EVENTS MEMORY	Up to 300 events, resident in E^2 Prom not volatile (10 years data memory)
POWER SUPPLY	230V AC ± 10% 50Hz
MAX. CONSUMPTION	2,6W (at 230V)
DATA PRESENTATION	3 X 7 segments display + 3 auxiliary information LEDs, incorporated in the polycarbonate control keys.
DIMENSIONS (mm)	185 X 105 X 185
WEIGHT (gr)	1.200

9. TECHNICAL CHARACTERISTICS OF THE DETECTOR

TECHNOLOGY	Semiconductor and µP 8 bit
POWER SUPPLY	From 8 to 20V DC 15V nominal
CONSUMPTION AT READING	10mA
DECONTAMINATION CONSUMPTION	138mA max
COOLING CONSUMPTION	22 mA
AVERAGE RESOLUTION	± 9 ppm at 20º C and 21% O_2 - 10% minimum-
MEASUREMENT RANGE	From 0 to 300 ppm CO
RESPONSE SPEED	One reading every 150 s
SENSOR LIFE	5 years (depending on environment)
TEMPERATURE COMPENSATION	Automatic, by means of an integrated temperature sensor from <12ºC and >30ºC
STANDARD ENVIRONMENTAL CONDITIONS	10ºC-35ºC & 50%-80% relative humidity
HEIGHT AND PLACE INSTALLATION	From 1.50-2 m height, on ceilings or columns
PRESENTATION AND DIMENSIONS	ABS injected box 90 mm. ø and 43 mm. depth. Not including base
INFLUENCE OF INTERFERING GASES	10.000 ppm of CO_2 / 3.000 ppm of CH_4 / 100 ppm of SO_2 or C_6H_6 / 50 ppm of NO_X = 3% of the reading
CONNECTION	3 parallel wires of 1.5 mm^2

10. CONNECTION



DETECTOR LED CODES	
1 BLINKING	OK CONFIG. GROUP 1
2 BLINKING	OK CONFIG. GROUP 2
BLINKING/ SLOW	FUSE SENSOR FILAMENT
BLINKING/ FAST	DETECTOR AND CONT. UNIT WRONG TX/RX
PERMANENTLY LIT UP	ALARM 50 ppm

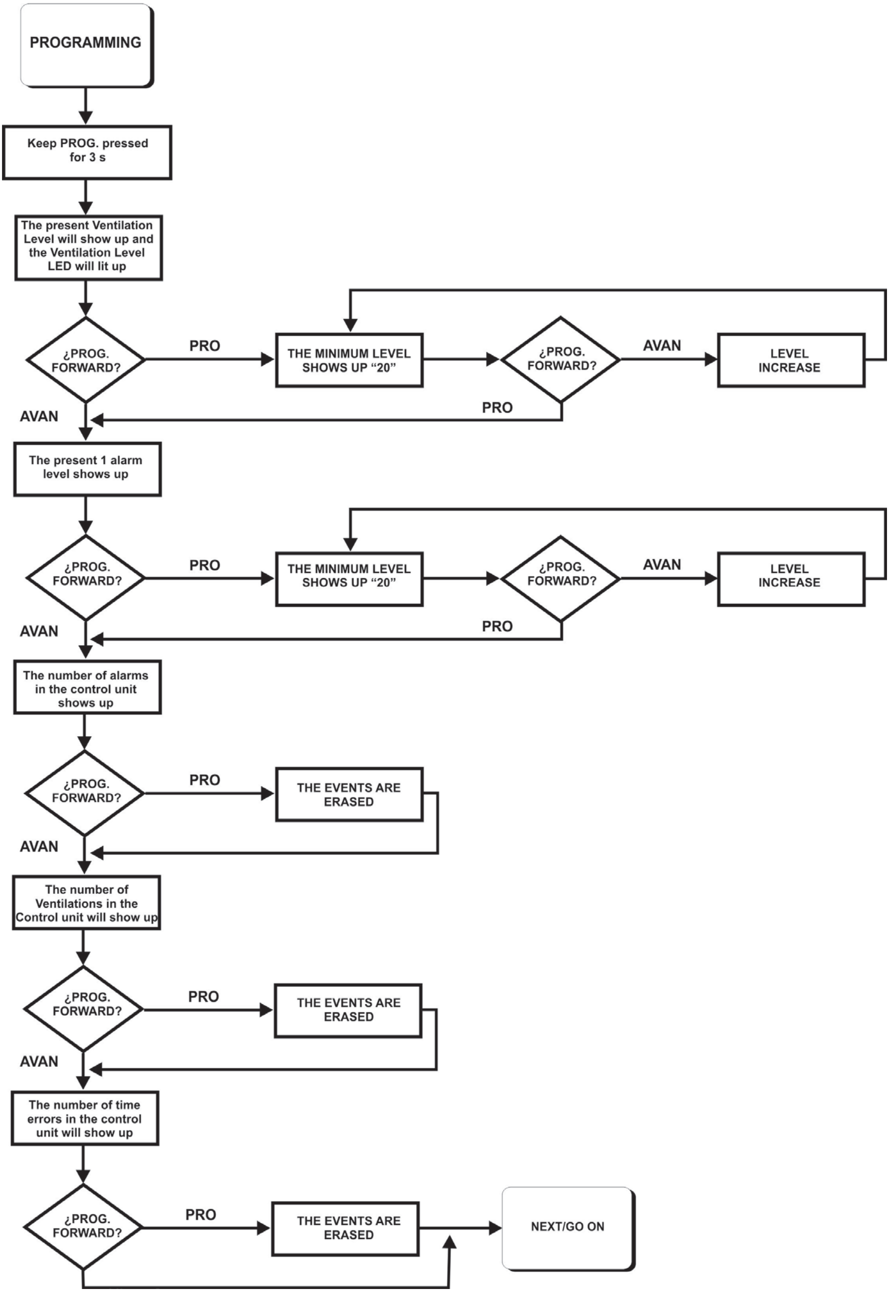
CONFIGURATION OF THE DETECTOR WARM UP GROUP	
PLACED BRIDGE	GROUP 1
SET OF BRIDGE	GROUP 2

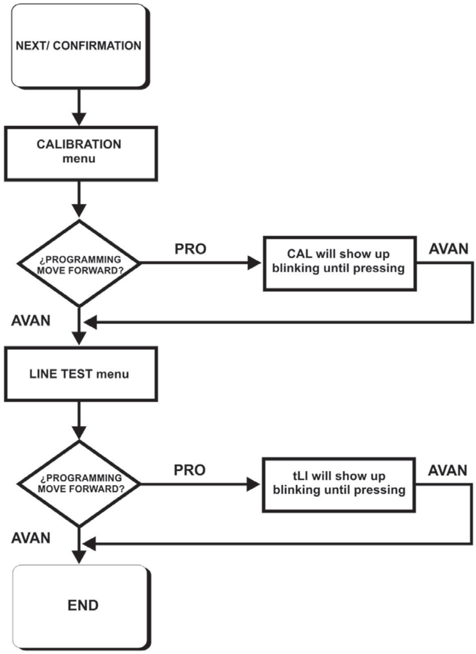
GENERAL	
PROGRAMMING ENTER	PRESS DURING 3 s PROG. PUSH BUTTON
GENERAL TEST	PRESS DURING 3 s TEST PUSH BUTTON
BLINKING VENTILATION LED	AUTOMATIC VENTILATION MODE
SET OFF VENTILATION LED	DISCONNECTED VENTILATION
LIT UP VENTILATION LED	CONNECTED AND/ OR MANUAL VENT.

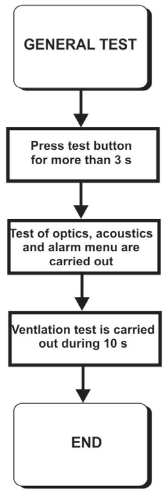
CONTROL UNIT ACOUSTIC MEANING	
BLINKING/ SLOW	VENTILATION LEVEL
BLINKING/ FAST	EVACUATION 1 ALARM LEVEL
FIXED	RANGE SATURATION
BLINKING/ VERY/ FAST	LINE ERROR
BLINKING/ VERY/ SLOW	SENSOR ERROR

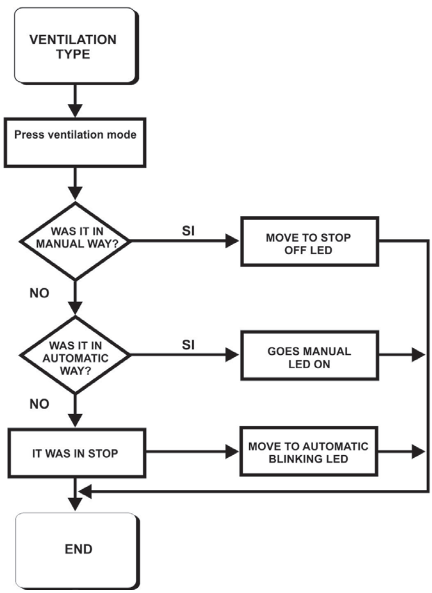
DISPLAY MESSAGES	
ELI	LINE ERROR
Sen	SENSOR ERROR
Sat	SATURATION
CAL	CALIBRATION
Gr1/Gr2	WARM UP GROUP
TLI	LINE TEST

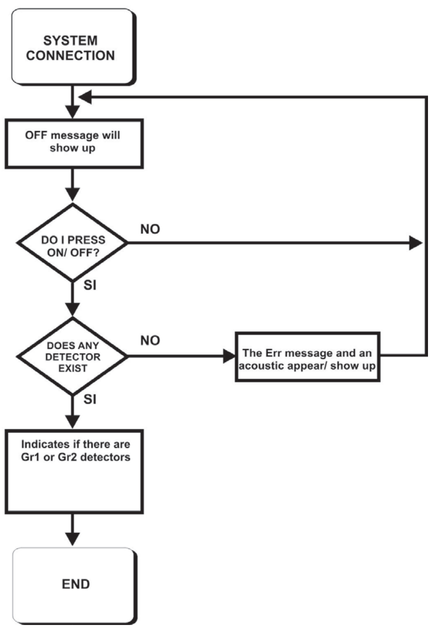
11. QUICK PROGRAMMING




NEXT/ CONFIRMATION
CALIBRATION menu
¿PROGRAMMING MOVE FORWARD?
PRO
CAL will show up blinking until pressing
AVAN
AVAN
LINE TEST menu
¿PROGRAMMING MOVE FORWARD?
PRO
tLI will show up blinking until pressing
AVAN
AVAN
END


GENERAL TEST
Press test button for more than 3 s
Test of optics, acoustics and alarm menu are carried out
Ventlation test is carried out during 10 s
END


VENTILATION TYPE
Press ventilation mode
WAS IT IN MANUAL WAY?
SI
MOVE TO STOP OFF LED
NO
WAS IT IN AUTOMATIC WAY?
SI
GOES MANUAL LED ON
NO
IT WAS IN STOP
MOVE TO AUTOMATIC BLINKING LED
END


SYSTEM CONNECTION
OFF message will show up
DO I PRESS ON/ OFF?
NO
SI
DOES ANY DETECTOR EXIST
NO
The Err message and an acoustic appear/ show up
SI
Indicates if there are Gr1 or Gr2 detectors
END

12. RECOMMENDATIONS

1.- Do not connect the detectors to their bases until the whole building work has been carried out and remember that once installed, power should be provided as soon as possible.

2.- To carry out the installation, use an individual duct and avoid installing the detector close to sources that generate electromagnetic disturbances (fluorescent lights, engines, counters, etc.) If you cannot avoid installing them close to these disturbances, we recommend you to use shielded cable (hose).

3.- Do not use the detector base as a register box to make service connections to more than one detector, use the terminals supplied for the cabling of the detector base.

4.- Do not drill holes in the Control Unit cabinet, as the metallic shavings could irreversibly damage the electronics.

5.- In compliance with the STANDARD EN 6.1010-1, 1.5 mm^2 monopole cable should be used for the 230V AC connection to the Control Unit, protecting the input with a 5A contactor or circuit breaker and installing it as close as possible to the Control Unit.

6.- When designing the installation, try to avoid long stretches of cables to avoid voltage drops.

7.- Do not manipulate the module lines or the detectors without previously disconnecting the Control Unit.

8.- Remember that the minimum voltage needed for a detector to be able to function is 8V and check the voltage of the last detector on the line.

9.- The carbon-activated filter of the DURAN 203 PLUS detector should be replaced when it is 2.5 years old. The calibration of the detector, should be carried out in 5 years at our laboratory or at any other authorised by DURAN ELECTRONICA.

10.- REMEMBER that the detectors should not be left in the installation when:

- The Control Unit or the lines are disconnected.
- There is no voltage or when there is only temporary power supply for the building work.
- The building work has not been completely finished.
- When maintenance work is being carried out, such as painting, changes to structure, when floors are being degreased, etc.

When any of the above circumstances cannot be avoided:

- Disconnect the Control Unit.
- Remove the detectors, store them in their boxes and keep them in a clean and dry place.

13. CERTIFICATIONS & HOMOLOGATIONS

Mini DURAN 203 Control Unit holds the following Certifications and Homologations:

Certificate N° 94604/01 from the **OFFICIAL LABORATORY J.M. MADARIAGA.**

Homologation CDM-0008 from the **MINISTRY of INDUSTRY and ENERGY.**

AENOR Certificate in accordance to **EN 61010-1:93.**

14. GUARANTEE

DURAN ELECTRONICA guarantees that **Mini DURAN 203** Control Unit has been manufactured subject to strict quality controls.

Mini DURAN 203 is guaranteed against any manufacturing defect for 1 year from the date of purchase. If during this period of time any anomaly is detected, please advise your supplier or installer.

The guarantee covers the total repair of the equipment that **DURAN ELECTRONICA** technical services consider to be defective, so that the equipment can return to its normal use. This guarantee will only be valid if the equipment has been installed by a competent person and following the specifications in this manual. Negligent use or installation will exempt **DURAN ELECTRONICA** from its responsibilites for damage caused to property and/or people and from the fulfilment of the terms of this guarantee.

The guarantee does not cover:

Installations, periodical checks and maintenance.

Repairs caused by improper handling, inappropriate use, negligence, overload, insufficient power supply or neglecting the equipment, voltage shorts, defective installation and other external causes.

Repairs or adjustments carried out by personnel not authorised by DURAN ELECTRONICA.

Equipment transport costs.

DURAN ELECTRONICA reserves the right to carry out improvements or to include modifications to this equipment without prior notice.

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Certificado nº FS 82426